

installation holes. The serrations 80 assist in centering the spacer insert to improve the sealability.

Finally, during the cure cycle of the adhesive, outgasing can occur by the solvents in the adhesive 78 and create a gas pressure that can tend to dislocate the spacer 70 from its installation. The serrations 80, by adding a frictional engagement, help counter this possible displacement of spacers.

As illustrative of possible dimensions for the spacer 70 in Fig. 12 and not as a limitation, the initial height of the spacer before the deformation of the entrance rim 88 can be approximately .460 inches, the diameter of the flange 76 can be .875 inches, the intermediate outer body concave groove 86 can include slanted surfaces of  $45^\circ$  with a center radius  $R_3$  of .057 inches. The axial length  $L_1$  of the inner groove 84 is approximately .065 inches, having an upper radius  $R_1$  of approximately .020 inches and a lower radius  $R_2$  of approximately .027 inches. The entrance rim has a slight inner bevel and the thickness of the rim wall between the outer cylindrical surface 72 and the inner annular groove 84 is approximately .030 inches. The dimension of the axial length  $L_3$  of the serrated portion 80 is approximately .080 inches. Finally, the dimension  $L_2$  of the outer cylindrical surface 72 is approximately .190 inches. These dimensions should not be construed as limitations to the scope of the present invention, but rather are set forth as possible operative dimensions for an aluminum alloy material of 6061-T6.

The thickness of the sealant 74 can be approximately .002 inches. While not shown, a sealant can also be provided on the beveled surface between the groove 84 and the bore 82.

Referring to Fig. 13, the tool 90 includes an annular flat indented recess 92 for applying a downward force on the flat annular rim 88 of the spacer 70. A support post

94 assists in alignment of the tool 90 along with the post 96 which is dimensioned to enter the bore 82.

Referring to Fig. 14, a perspective view of the spacer 70 mounted within a sandwich panel 100 is disclosed.

- 5        Those skilled in the art will appreciate that various adaptations and modifications of the just-described preferred embodiment can be configured without departing from the scope and spirit of the invention. Therefore, it is to be understood that, within the scope of the appended claims, the invention may be practiced other than as specifically described herein.